RESEARCH DEPARTMENT

The service area of the Manningtree television transmitter

REPORT No. K·160

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THE BRITISH BROADCASTING CORPORATION
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RESEARCH DEPARTMENT

THE SERVICE AREA OF THE MANNINGTREE TELEVISION TRANSMITTER

Report No. K-160

(1963/21)

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SUMMARY

This report presents the results of a field strength survey of the television transmitter at Manningtree. The service provided is very severely restricted by the high level of interference caused by United Kingdom co-channel stations and the Belgian television station located at Liège. Nevertheless, the principal towns in the service area are provided with a good service for a high proportion of the time.

1. GENERAL

The Manningtree television station came into service on 22nd May 1962. The station is situated 2 miles (3·2 km) south-west of the village of Manningtree at a height of 118 ft (36 m) above mean sea level. The transmission, on Channel 4 (vision 61·75 Mc/s, sound 58·25 Mc/s), is horizontally polarized and is provided by two 0·5 kW transmitters (underrun at 0·41 kW) driving an aerial consisting of eight dissimilar tiers. The mean aerial height is 447 ft (136 m). The maximum and minimum effective radiated powers (e.r.p. s) are 4·5 kW and 0·5 kW respectively. The shape of the horizontal radiation pattern (h.r.p.) is shown in Fig. 1.

2. RESULTS AND DISCUSSION

The results of the survey are presented in a field strength contour map (Fig. 1) and details of the field strength in towns and villages measured are given in the Appendix. The map shows the service area to be severely restricted by interference caused by United Kingdom co-channel transmissions, the field strength protected for 90% of the time varying from 62 dB(μV/m) to 66 dB(μV/m) when allowance is made for receiving aerial directivity. A further source of interference is the sound transmission (f = 60·75 Mc/s) of the Liège television station. This source is expected to interfere with reception up to signal levels of 66 dB for 10% of the time, and when it coincides with severe United Kingdom co-channel interference the field strength protected for 90% of the time will be 70 dB(μV/m) or even more on occasions.

Nevertheless, the Manningtree transmitter does provide a good service to viewers in the principal towns for a large proportion of the time. Ipswich, which is the largest town in the area (population 117,325) has a median field strength

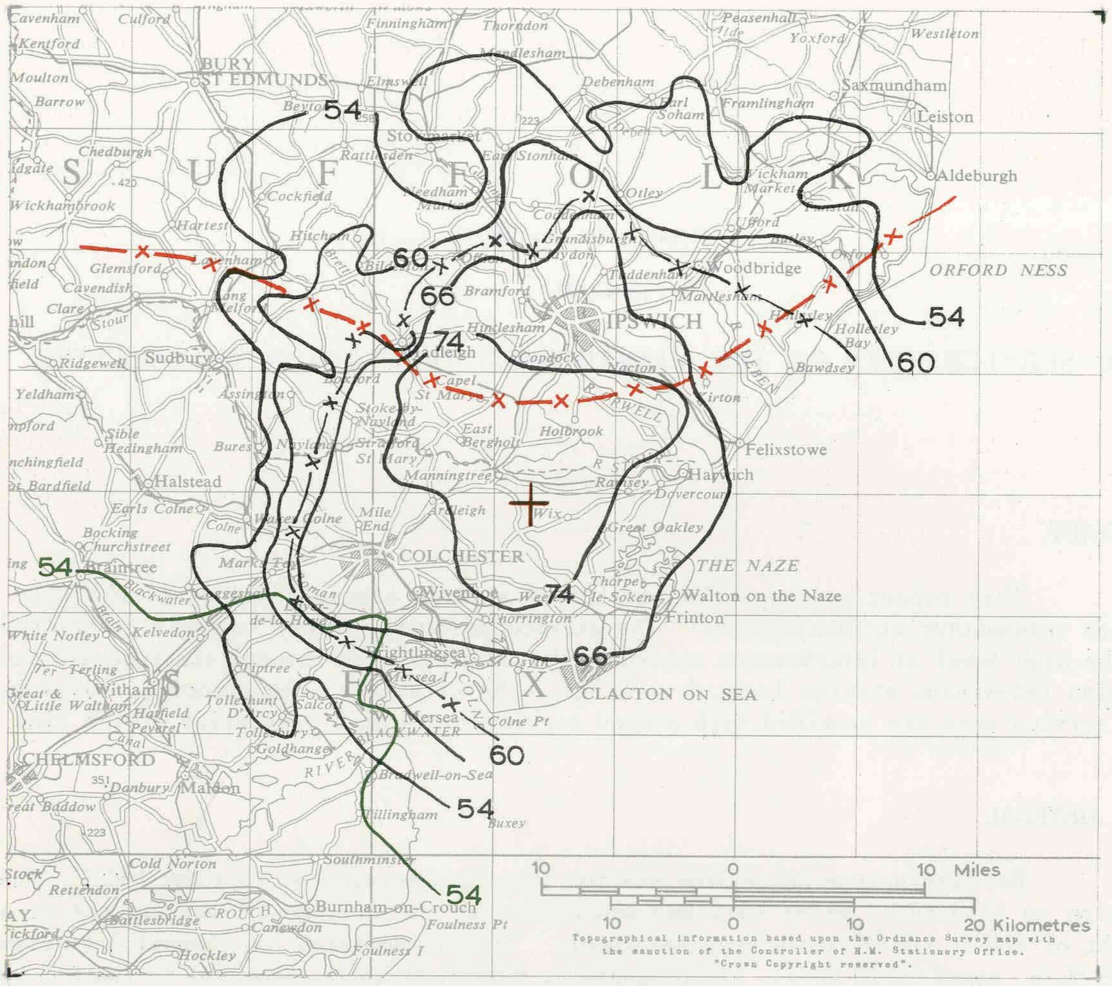


Fig. 1 - MANNINGTREE
Channel 4 (61·75 Mc/s)

SITE HEIGHT: 118 ft (36 m) a.m.s.l.

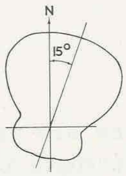
AERIAL HEIGHT: 447 ft (136 m) a.g.l.

E.R.P.: 1·8 kW

POLARIZATION: HORIZONTAL

H.R.P.: DIRECTIONAL

AERIAL: EIGHT TIERS TANGENTIAL DIPOLES. (DISSIMILAR TIERS)



H.R.P.: AERIAL SECTION DRG. No. AE544

NOTES

1. The contours represent the field strength in decibels (dB) relative to 1μV/m [dB(μV/m)] at 30ft (9·1 m) above ground exceeded at 50% of receiving sites in a given locality. The value exceeded at 90% of receiving sites may be as much as 10 dB below the value indicated by the contours, particulary in hilly and built-up areas.

2. —x—x—x— Limit of service area free from perceptible co-channel interference from all U.K. co-channel transmitters for 90% of the time based on a protection ratio of 45 dB with a reduction of 10 dB for cross-polarization and 10 dB for frequency offsets, allowance being made for receiving aerial directivity.

3. Interference due to Liège may be expected to interfere with levels up to 66 dB for 10% time.

4. —x—x—x— Norwich U.K. co-channel interference limit [approximate field strength 43 dB(μV/m)].

5. ———— Crystal Palace 54 dB(μV/m) contour.

of 71 dB(μV/m), while 90% of the population receives a signal level of at least 65 dB(μV/m). Colchester, with a population of 65,072, is not so well served, 50% and 90% of the population receiving field strengths in excess of 66 dB(μV/m) and 62 dB(μV/m) respectively. The interference caused by the Liège transmitter will be most severe in the coastal towns of Clacton, Frinton, Walton on the Naze, Harwich and Felixstowe, but the use of good receiving aerials should provide a large measure of protection resulting in a satisfactory service to most viewers.

3. CONCLUSIONS

The service provided by the Manningtree transmitter achieves that predicted from the site tests. Most viewers will receive a good service, but when conditions favour long distance tropospheric propagation, United Kingdom and Continental transmitters may both cause interference in those areas in which the Manningtree field strength level is less than about 66 dB(μV/m).

APPENDIX

Town	Field Strength (dB rel. 1 μV/m) at 30 ft (9·1 m) a.g.l. at stated percentage locations 10%	50%	90%
Alderton	67	64	62
Ardleigh	76	73	70
Bawdsey	66	63	60
Bildeston	57	53	49
Boxford	62	56	51
Brantham/Cattawade	99	95	93
*Brightlingsea	71	64	57
Bures	56	51	44
Campsey Ash	62	58	54
Capel St. Mary	83	79	73
Chelsworth	63	61	55
Clacton on Sea	67	63	59
Claydon	69	65	60
Coddenham	67	62	53
*Coggeshall	53	48	43
*Colchester	71	66	62
Debenham	53	48	44
Dennington	50	47	43
*Felixstowe	70	65	60
Fordstreet	58	54	52
*Framlingham	58	50	45
Framsden	54	49	46
Frating Green/Balls Green	79	77	64
*Frinton	68	64	61
Goldhanger	52	49	43
Great Bromley	76	75	74
Great Holland	69	66	64
Grundisburgh	65	59	54
*Hadleigh	64	60	56
*Harwich/Dovercourt	74	67	60
Hintlesham	77	74	70
Hitcham	65	61	52
Hollesley	64	61	57
*Ipswich	77	71	65

*Towns with population above 2,000

Town	Field Strength (dB rel. 1 μV/m) at 30 ft (9·1 m) a.g.l. at stated percentage locations		
	10%	50%	90%
*Kelvedon	50	46	42
Kesgrave	64	62	56
Kirby Cross	70	66	62
Kirton	67	64	61
Lavenham	57	53	46
Little Clacton/Weeley Heath	74	71	66
*Long Melford	56	47	43
Martlesham	59	55	50
Melton	63	60	57
Monks Eleigh	61	58	53
Needham Market	58	53	48
Newbourn	63	60	55
Newton	60	58	52
Orford	56	53	45
Saxmundham	51	46	42
Shottisham	66	63	57
*Stowmarket	58	53	48
Stratford St. Mary	78	74	69
*Sudbury	50	44	41
Tendring	83	81	79
The Garrison	57	55	53
Thorpe-le-Soken	75	72	68
*Tiptree	59	57	53
Tolleshunt D'Arcy	60	58	54
Trimley	75	72	69
Trimley Heath	74	69	66
Tunstall	56	52	46
Wakes Colne	53	47	42
*Walton on the Naze	69	65	59
*West Mersea	62	58	52
Wickham Market	58	54	46
*Woodbridge	67	62	55

* Towns with population above 2,000

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